

The claims:

1. A method of providing computer-based recognition of natural language data, comprising the steps of:

5 generating natural language data using an input device; and,
transmitting the natural language data to a server via a network;

wherein, the server is programmed and configured to process the natural language data using a recognizer residing on the server to produce intermediate format data, and is further programmed and configured to transmit the intermediate format data to an application, and
10 further wherein, the intermediate format data is decoded into computer-readable format data using context information associated with the application.

2. A method for computer-based recognition of natural language data, the method implemented on a network and comprising the steps of:

15 obtaining natural language data using an input device;
receiving the natural language data on a server via the network;
processing the natural language data using a recognizer residing on the server to produce intermediate format data;
transmitting the intermediate format data to an application; and,
20 decoding the intermediate format data into computer-readable format data using context information associated with the application.

3. The method as claimed in claim 1 or 2, wherein the natural language data is digital ink or speech.

25 4. The method as claimed in claim 1 or 2, wherein processing the natural language data includes one or more of:

normalizing the data;
segmenting the data; and
30 classifying the data.

5. The method as claimed in claim 1 or 2, wherein the recognizer is implemented using software or hardware.

6. The method as claimed in claim 1 or 2, wherein the intermediate format data is a Directed Acyclic Graph (DAG) data structure.
- 5 7. The method as claimed in claim 6, wherein the DAG data structure is a matrix containing the processing results of segments of the natural language data.
8. The method as claimed in claim 1 or 2, wherein the intermediate format data includes segmented time-series classifier data.
- 10 9. The method as claimed in claim 1 or 2, wherein the natural language data is derived from protein sequencing, image processing, computer vision or econometrics.
- 15 10. The method as claimed in claim 1 or 2, wherein the application is remote to both the input device and the server.
11. The method as claimed in claim 1 or 2, wherein the application resides on the server.
- 20 12. The method as claimed in claim 1 or 2, wherein the context information is a user dictionary.
13. The method as claimed in claim 1 or 2, wherein the recognizer can be trained for a specific user.
- 25 14. The method as claimed in claim 1 or 2, wherein the input device is associated with a paper-based interface provided with coded markings.
15. The method as claimed in claim 14, wherein the coded markings are a pattern of
30 infrared markings.
16. The method as claimed in claim 14, wherein the input device is an optically imaging pen.

17. The method as claimed in claim 14, wherein each paper-based interface is uniquely identified and stored on a network server.

5 18. A method for computer-based recognition of natural language data, comprising the steps of:

receiving natural language data at a server from a remote input device;

processing the natural language data using a recognizer residing on the server to produce intermediate format data; and,

10 transmitting the intermediate format data to an application;

wherein, the application is programmed and configured to decode the intermediate format data into computer-readable format data using context information associated with the application.

15 19. A method of providing computer-based recognition of natural language data for interaction with an application, wherein natural language data is received at a server from a remote input device, and the server processes the natural language data using a recognizer residing on the server to produce intermediate format data, the method comprising:

the application receiving the intermediate format data from the server; and,

20 the application decoding the intermediate format data into computer-readable format data using context information associated with the application.

20. A method of recognising digital ink input by a user into a computer-based digital ink recognition system, the user interacting with a paper-based document, the paper-based
25 document having disposed therein or thereon coded data indicative of a particular field of the paper-based document and of at least one reference point of the paper-based document, the method including the steps of:

receiving in a server, indicating data from a sensing device, operated by the user, regarding the identity of the paper-based document and at least one of a position and a
30 movement of the sensing device relative to the paper-based document;

processing the indicating data using a recognizer residing on the server to produce intermediate format data; and,

transmitting the intermediate format data to an application;

wherein, the application decodes the intermediate format data into computer-readable format data using context information associated with the paper-based document;

further wherein, the sensing device comprises:

(a) an image sensor adapted to capture images of at least some of the coded data

5 when the sensing device is placed in an operative position relative to the paper-based document; and

(b) a processor adapted to:

(i) identify at least some of the coded data from one or more of the captured images;

10 (ii) decode at least some of the coded data; and

(iii) generate the indicating data using at least some of the decoded coded data.

21. A method of recognising digital ink input by a user into a computer-based digital ink recognition system, the method including the steps of:

15 providing a user with a paper-based document, the paper-based document having disposed therein or thereon coded data indicative of a particular field of the paper-based document and of at least one reference point of the paper-based document;

receiving in a server, indicating data from a sensing device, operated by the user, regarding the identity of the paper-based document and at least one of a position and a movement of the sensing device relative to the paper-based document;

processing the indicating data using a recognizer residing on the server to produce intermediate format data;

transmitting the intermediate format data to an application;

25 decoding the intermediate format data into computer-readable format data using context information associated with the paper-based document;

wherein the sensing device comprises:

(a) an image sensor adapted to capture images of at least some of the coded data when the sensing device is placed in an operative position relative to the paper-based

30 document; and

(b) a processor adapted to:

(i) identify at least some of the coded data from one or more of the captured images;

- (ii) decode at least some of the coded data; and
- (iii) generate the indicating data using at least some of the decoded coded data.

5 22. The method as claimed in claim 20 or 21, wherein the particular field of the paper-based document is associated with at least one zone of the paper-based document, and the method includes identifying the context information from the at least one zone.

23. A system for computer-based recognition of natural language data, the system
10 implemented on a network and comprising:

a server to receive natural language data generated by an input device via the network; and,

a recognizer residing on the server to process the natural language data to produce intermediate format data; wherein,

15 an application receives the intermediate format data and decodes the intermediate format data into computer-readable format data using context information associated with the application.

24. A system for computer-based recognition of natural language data, the system
20 implemented on a network and comprising:

an input device to generate natural language data;

a server to receive the natural language data via the network;

a recognizer residing on the server to process the natural language data to produce intermediate format data; and,

25 an application to receive the intermediate format data and to decode the intermediate format data into computer-readable format data using context information associated with the application.

25. The system as claimed in claim 23 or 24, wherein the input device is a pen-based
30 input device.

26. The system as claimed in claim 23 or 24, wherein the input device includes a microphone.

27. The system as claimed in claim 23 or 24, wherein the intermediate format data is transmitted to more than one application.

5 28. The system as claimed in claim 23 or 24, wherein the application initiates the processing of the natural language data.

29. The system as claimed in claim 23 or 24, including a recognizer manager to select a recognizer from a plurality of recognizers.